

SEXUALLY TRANSMITTED DISEASES TESTING IN CALIFORNIA 2001 Annual Clinical Laboratory Survey Summary

Introduction

Since 1996, the California Department of Health Services (CDHS), Division of Communicable Disease Control, Sexually Transmitted Diseases (STD) Control Branch has surveyed clinical laboratories throughout California that perform testing for syphilis, gonorrhea, or chlamydia.¹

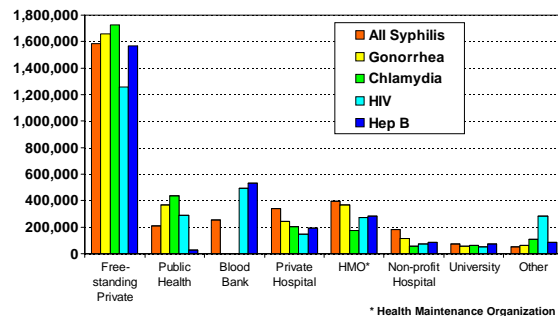
The Annual Clinical Laboratory Survey assists disease control efforts by identifying the number and types of laboratories performing STD testing, the number of tests performed, and trends in the use of test technologies.

Timely, accurate, and complete laboratory reporting of communicable diseases is essential to health department efforts to effectively identify public health problems and to design cost-effective interventions. California regulations require both health care providers and laboratories to report selected STDs to their local health departments; however, the majority of disease reports are initially received from laboratories.

Laboratories are legally mandated to report findings indicative of syphilis, gonorrhea, chlamydia, and hepatitis B to local health departments for case follow-up activity and epidemiologic analysis.² Acquired immune deficiency syndrome (AIDS) is also a reportable condition and non-name-based human immunodeficiency virus (HIV) reporting by providers became mandatory in California on July 1, 2002.³

This report summarizes information from the 2001 Annual Clinical Laboratory Survey. These data are presented along with 2001 disease trend information.

Figure 1. Number of STD Tests Performed by Type of Laboratory, 2001



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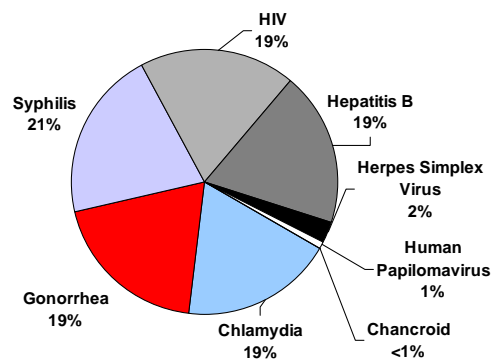
Overview

The 2001 Annual Clinical Laboratory Survey was sent to 566 California laboratories that potentially conducted testing for reportable STDs. This summary reports on the 447 labs that responded to our survey and conducted STD tests in 2001 (for further explanation, see Technical Notes, page 6).

In 2001, private sector (non-public health) laboratories performed the majority of all reported STD tests (Figure 1). Private labs conducted 93.4 percent of syphilis, 87.6 percent of gonorrhea, 85.9 percent of chlamydia, 90 percent of HIV, and 99.1 percent of hepatitis B tests. Free-standing private facilities performed the largest proportion (51 percent) of all syphilis, gonorrhea, chlamydia, HIV, and hepatitis B tests combined. Public health labs comprised only 11 percent of all tests.

Of the 15,529,560 laboratory tests performed to detect STDs, the largest proportions were for syphilis (21 percent), followed by chlamydia (19 percent), gonorrhea (19 percent), HIV (19 percent), and hepatitis B (19 percent) (Figure 2). The relative distribution of STD tests in 2001 is similar to 2000.

Figure 2. STD Tests Performed, 2001

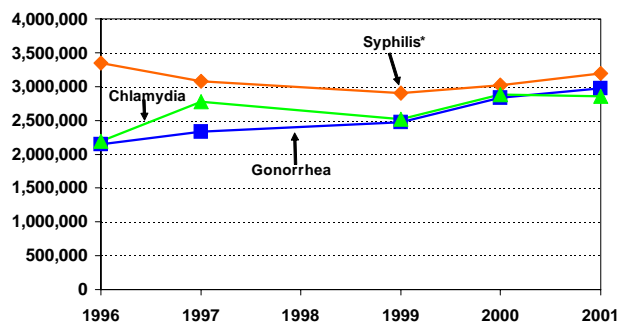


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Testing for Bacterial STDs

For each of the reportable bacterial STDs, information from California's case-based surveillance system is shown to provide a context for interpreting laboratory survey information. The total volume of tests in 2001 for chlamydia, gonorrhea, and syphilis is displayed in Figure 3.

Figure 3. Chlamydia, Gonorrhea, and Syphilis*, Total Number of Tests



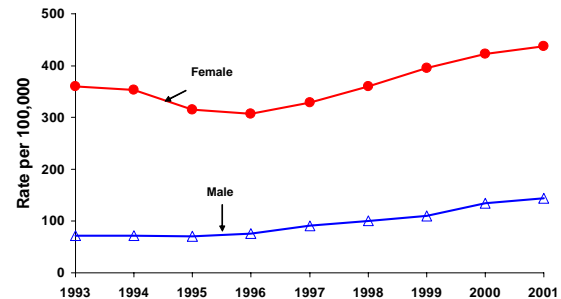
*Non-treponemal Syphilis Tests

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Chlamydia

- ◆ *Chlamydia trachomatis* remains the most commonly reported infectious disease in California and the United States.
- ◆ In 2001, the rate of chlamydia was 437.5 cases per 100,000 among females, and 143.9 per 100,000 among males. Reported rates have increased in both males and females since 1999 (Figure 4).

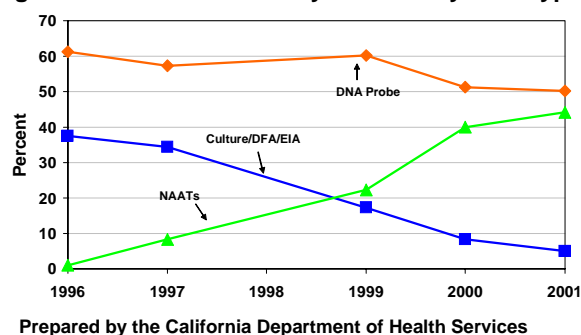
Figure 4. Chlamydia, Rates by Gender, California, 1993–2001



Prepared by the California Department of Health Services

- ◆ A total of 3,076,652 chlamydia tests were performed in 2001 (Appendix 1). The 6.3 percent increase in overall number of chlamydia tests since 2000 may be due to increases in targeted screening.
- ◆ Overall, 3.8 percent of all reported lab tests for chlamydia were positive.
- ◆ In 2001, the tests most commonly used for chlamydia were Nucleic Acid Amplification Tests (NAATs) (48.3 percent), followed by DNA probe (46.6 percent). Culture, direct fluorescent antibody (DFA), enzyme immunoassay (EIA), and other tests accounted for the remaining 5.1 percent (Figure 5).
- ◆ The National Chlamydia Laboratory Committee recommends performing negative grey zone supplemental testing to enhance the sensitivity of non-amplification test technologies.⁴ In 2001, 69 percent of labs that reported DNA probe testing repeated DNA probe findings in the grey zone.
- ◆ False positive STD test results cause unnecessary health care and emotional costs for patients and their partners. The Centers for Disease Control and Prevention (CDC) strongly recommends using verification assays to increase the specificity of DNA probes and EIA testing.⁵ Nearly one-third (32.9 percent) of laboratories that performed DNA or EIA testing reported performing verification assays in 2001.

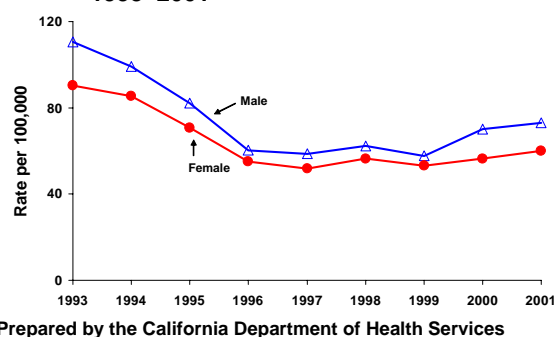
Figure 5. Percent of Chlamydia Tests by Test Type



Gonorrhea

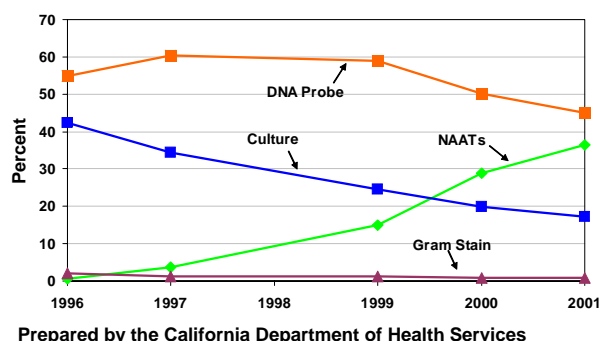
- ◆ *Neisseria gonorrhoeae* is the second most commonly reported infectious disease in California and the United States.
- ◆ Gonorrhea rates increased from 63.5 cases per 100,000 in 2000 to 67 cases per 100,000 in 2001. Rates have increased in both males and females (Figure 6).
- ◆ The labs surveyed reported performing a total of 2,977,605 gonorrhea tests in 2001, an increase of 5.7 percent from 2000 (Appendix 2).
- ◆ Overall, 1.6 percent of all reported lab tests for gonorrhea were positive.

Figure 6. Gonorrhea, Rates by Gender, California, 1993–2001



- ◆ NAATs increased from 3.7 percent of gonorrhea tests in 1997 to 36.4 percent in 2001 (Figure 7).
- ◆ In 2001, the most commonly used gonorrhea test was the DNA probe (45 percent), followed by NAATs (36.4 percent), and culture (17.2 percent).
- ◆ Use of culture decreased 43.4 percent between 1996 and 2001. Because culture specimens are necessary to test for antibiotic susceptibility, the decreasing number of cultures collected may impact the ability to monitor antibiotic resistance. Current high levels of fluoroquinolone resistance have prompted new treatment guidelines in California.⁶

Figure 7. Percent of Gonorrhea Tests by Test Type

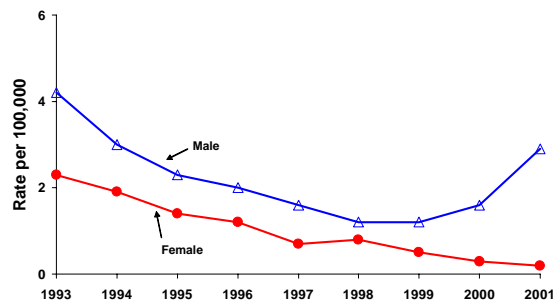


- ◆ Of laboratories that reported culture testing for gonorrhea, 59.8 percent reported beta-lactamase testing of isolates. Based on findings from the CDC Gonococcal Isolate Surveillance Project, which evaluates the antimicrobial resistance of *Neisseria gonorrhoeae*, penicillinase-producing *N. gonorrhoeae* is endemic at such levels that penicillin is no longer included as recommended treatment for gonorrhea.⁵ Thus, monitoring beta-lactamase levels is of little clinical value and is unnecessary.

Syphilis

- ◆ In 2001, the overall rate of primary and secondary syphilis in California was 1.6 cases per 100,000. This represents a substantial decline from 1991, when the rate was 8.5 cases per 100,000.
- ◆ In 2001, the rate of syphilis was 0.2 per 100,000 among females, and 2.9 per 100,000 among males (Figure 8). Higher rates in men have been associated with outbreaks among men who have sex with men (MSM). The epidemic of syphilis among MSM has continued through 2001 in California.

Figure 8. Primary & Secondary Syphilis, Rates by Gender, California, 1993–2001



Prepared by the California Department of Health Services

- ◆ Labs surveyed in California reported 3,195,338 tests for syphilis in 2001 (Appendix 3).
- ◆ Of all tests for syphilis, 92 percent were non-treponemal serology tests and 8 percent were treponemal serology or other tests. Few (573) were darkfield or direct fluorescent antibody *Treponema pallidum* (DFA-TP) tests.
- ◆ Of the reported non-treponemal serology tests, 1.6 percent were reactive; of the treponemal serology tests 33.9 percent were positive.

- ◆ Rapid plasma reagin (RPR) accounted for 96 percent of all non-treponemal serology tests performed. Venereal Disease Research Laboratory (VDRL) tests accounted for 4 percent.
- ◆ Of the 377 labs that performed non-treponemal serology tests, 248 (65.8 percent) reported diluting “rough” tests to rule out prozone reactions. This practice is recommended by the CDC to increase the sensitivity of these tests in early syphilis and reduce false negative test results.⁷
- ◆ Fluorescent treponemal antibody absorption (FTA-Abs) accounted for 48.1 percent of treponemal serology tests, followed by *Treponema pallidum* particle agglutination (TP-PA) assay with 33.4 percent. EIA tests made up the remaining 18.5 percent of treponemal serology tests.

Chancroid

- ◆ Only two cases of chancroid were reported in California in 2001.
- ◆ Seventeen laboratories (4.2 percent) reported 298 tests for chancroid in 2001, all of which were cultures. Two of the tests were positive.

Testing for Viral STDs

Hepatitis B

- ◆ Of the surveyed labs, 201 (45 percent) performed a total of 2,877,605 hepatitis B surface antigen tests.
- ◆ 2.2 percent of reported hepatitis B surface antigen tests were positive.

Human Immunodeficiency Virus (HIV)

- ◆ Of the labs surveyed, 239 (53.3 percent) performed a total of 2,897,265 HIV tests.
- ◆ The majority (82.2 percent) of the tests performed were EIA screening tests. Confirmatory testing (Western blot and immunofluorescent assay (IFA)) accounted for 2.9 percent of all tests. Qualitative Polymerase Chain Reaction (PCR) testing comprised 2.1 percent of all HIV testing. Other screening tests (mostly unspecified blood bank tests) accounted for 12.8 percent of HIV tests.
- ◆ Of the 2,382,927 EIA screening tests performed, 1.1 percent were positive.
- ◆ Of the 81,408 Western blots performed, 54.4 percent were positive; of the 2,176 IFA tests, 90.5 percent were positive.
- ◆ In addition to HIV detection tests, other HIV related tests were reported by labs surveyed. These included 381,513 viral load tests and 234,841 CD4 count tests.

Human Papillomavirus (HPV)

- ◆ Fourteen laboratories (3.1 percent) included in the survey offered HPV DNA testing in 2001, performing a total of 135,496 tests. Almost all tests were hybrid capture assays.
- ◆ Of HPV tests performed, 38.3 percent were positive.
- ◆ Because the sampling for this survey emphasized testing for bacterial STDs or HIV (e.g., cytopathology laboratories were not sampled), these totals may be an underestimate of HPV testing activities.

Herpes Simplex Virus (HSV)

- ◆ Of the labs included in the survey, 92 (21 percent) performed 369,301 HSV tests. Of these, 39.1 percent were culture or direct antigen detection, 53.1 percent were serologic tests, and 7.8 percent were other types of tests. Serologic testing increased by 54.7 percent from 2000 to 2001.
- ◆ Of all non-serologic tests performed, 86.6 percent were culture tests, 24.1 percent of which were positive.
- ◆ Of serology tests performed, 100 percent were type-specific HSV-2 tests, 22.4 percent of which were positive. Serology tests that do not distinguish between HSV-1 and HSV-2 have limited clinical value.

Summary

Survey data for 2001 documented more than 15 million STD tests in California.

The use of NAATs for chlamydia has increased, accounting for 48.3 percent of all chlamydia tests in 2001. NAAT technologies provide the greatest sensitivity, offer the advantage of using non-invasive specimen collection, and were recommended by the California Chlamydia Action Coalition (CCAC) beginning in 2001.⁸

Gonorrhea culture testing has decreased, accounting for 17.2 percent of all gonorrhea tests in 2001. This decline may adversely affect future antibiotic resistance testing. Current high levels of fluoroquinolone resistance have prompted new gonorrhea treatment guidelines in California. Overall gonorrhea testing has increased by 5.7 percent from 2000 to 2001.

Technical Notes:

In June 2002, surveys were mailed to all laboratories that had indicated on the 2000 survey they performed STD testing. Surveys were also mailed to laboratories that had been licensed after 2000.

Los Angeles County Department of Health Services' STD Control Program conducted the laboratory survey for laboratories located in Los Angeles County. All other laboratories in California were surveyed by CDHS, STD Control Branch. Data from both surveys were merged for analysis.

Of the 566 labs that received surveys, 30 did not return the survey and 75 indicated that they were draw stations only, had closed, did not perform STD testing, or refused to complete the survey. Of the remaining 461 labs capable of STD testing, 447 reported actual STD tests performed in 2001, and these labs were included in this survey summary.

Additional Resources

¹Information on previous laboratory reports and disease trends can be found at the California STD Control Branch website: www.dhs.ca.gov/ps/dcdc/STD/stdindex.htm

²Information about infectious disease reporting, including a list of reportable diseases and reporting laws, can be found at the California Disease Investigations and Surveillance Branch website. See "Laboratory Reportable Diseases and Conditions": www.dhs.ca.gov/ps/dcdc/html/publicat.htm

³Information about HIV reporting can be found at the California Office of AIDS website. See "HIV Reporting Regulations": <http://www.dhs.ca.gov/aids/>

⁴National Chlamydia Laboratory Committee, "Negative Grey Zone Supplemental Testing to Enhance Sensitivity of Chlamydia Enzyme Immunoassays and Nucleic Acid Probe Assays": www.aphl.org/docs/NCCNGZTesting.pdf

⁵Recent CDC guidelines for chlamydia and gonorrhea testing: MMWR Oct 18 2002; 51(RR-15): 1-27. www.cdc.gov/mmwr/preview/mmwrhtml/rr5115a1.htm

⁶Fluoroquinolone resistance information can be found at the California STD Control Branch website. See "Gonorrhea Treatment Guidelines": www.dhs.ca.gov/ps/dcdc/STD/stdindex.htm

⁷Recent CDC guidelines for syphilis laboratory testing can be found on the CDC website: www.cdc.gov/std/program/medlab/ApE-PGmedlab.htm

⁸CCAC Recommendations for Screening: www.ucsf.edu/castd/downloadable/uspstfct.pdf

Appendix 1: CHLAMYDIA TESTING IN CALIFORNIA, 1996-2001

STD & Type of Test	Test Characteristics	Testing Year (# of responding laboratories that conducted Chlamydia testing)														
		1996			1997			1999			2000			2001		
		PUBLIC (46)	PRIVATE (705)	TOTAL (751)	PUBLIC (44)	PRIVATE (637)	TOTAL (681)	PUBLIC (41)	PRIVATE (530)	TOTAL (571)	PUBLIC (38)	PRIVATE (238)	TOTAL (276)	PUBLIC (36)	PRIVATE (202)	TOTAL (238)
CHLAMYDIA Culture	# of tests	6,771	90,023	96,794	4,747	309,061	313,808	2,749	52,685	55,434	2,232	41,515	43,747	1,663	37,808	39,471
	# positive tests	478	2,428	2,906	318	2,096	2,414	82	1,105	1,187	69	861	930	53	769	822
	% positive*	7.1%	2.7%	3.0%	6.7%	0.7%	0.8%	3.0%	2.1%	2.1%	3.1%	2.1%	2.1%	3.2%	2.0%	2.1%
CHLAMYDIA DFA	# of tests	8,305	69,548	77,853	5,145	116,481	121,626	3,259	46,844	50,103	3,473	33,088	36,561	3,295	57,548	60,843
	# positive tests	1,157	2,325	3,482	428	2,509	2,937	233	1,238	1,471	337	722	1,059	316	782	1,098
	% positive*	13.9%	3.3%	4.5%	8.3%	2.2%	2.4%	7.1%	2.6%	2.9%	9.7%	2.2%	2.9%	9.6%	1.4%	1.8%
CHLAMYDIA EIA	# of tests	112,985	553,685	666,670	78,478	437,493	515,971	13,701	314,566	328,267	8,436	152,570	161,006	3,901	39,007	42,908
	# positive tests	6,020	18,726	24,746	3,879	16,794	20,673	1,193	10,529	11,722	555	7,501	8,056	131	2,138	2,269
	% positive*	5.3%	3.4%	3.7%	4.9%	3.8%	4.0%	8.7%	3.3%	3.6%	6.6%	4.9%	5.0%	3.4%	5.5%	5.3%
CHLAMYDIA DNA Probe	# of tests	80,438	1,167,789	1,248,227	77,669	1,509,960	1,587,629	51,362	1,473,663	1,525,025	23,344	1,461,647	1,484,991	17,834	1,416,656	1,434,490
	# positive tests	1,827	34,395	36,222	2,671	31,521	34,192	2,003	48,279	50,282	1,148	41,397	42,545	661	44,770	45,431
	% positive*	2.3%	2.9%	2.9%	3.4%	2.1%	2.2%	3.9%	3.3%	3.3%	4.9%	2.8%	2.9%	3.7%	3.2%	3.2%
CHLAMYDIA LCR	# of tests	18,608	12,896	31,504	82,460	46,878	129,338	212,341	212,964	425,305	167,762	216,283	384,045	201,597	489,147	690,744
	# positive tests	931	466	1,397	5,285	5,636	10,921	12,020	9,223	21,243	7,976	10,071	18,047	12,627	21,456	34,083
	% positive*	5.0%	3.6%	4.4%	6.4%	12.0%	8.4%	5.7%	4.3%	5.0%	4.8%	4.7%	4.7%	6.3%	4.4%	4.9%
CHLAMYDIA PCR	# of tests	68,041	8,068	76,109	91,493	10,657	102,150	96,179	31,812	127,991	111,977	214,099	326,076	27,383	291,171	318,554
	# positive tests	5,305	305	5,610	6,087	121	6,208	6,543	925	7,468	8,001	6,649	14,650	1,875	9,438	11,313
	% positive*	7.8%	3.8%	7.4%	6.7%	1.1%	6.1%	6.8%	2.9%	5.8%	7.1%	3.1%	4.5%	6.8%	3.2%	3.6%
CHLAMYDIA TMA	# of tests	-	-	-	2,202	-	2,202	11,217	-	11,217	9,953	104,565	114,518	6,616	1,946	8,562
	# positive tests	-	-	-	118	-	118	519	-	519	321	5,874	6,195	231	123	354
	% positive*	-	-	-	5.4%	0.0%	5.4%	4.6%	0.0%	4.6%	3.2%	5.6%	5.4%	3.5%	6.3%	4.1%
CHLAMYDIA SDA	# of tests	-	-	-	-	-	-	-	-	-	81,508	252,771	334,279	171,293	295,595	466,888
	# positive tests	-	-	-	-	-	-	-	-	-	2,824	9,356	12,180	8,786	13,570	22,356
	% positive*	-	-	-	-	-	-	-	-	-	3.5%	3.7%	3.6%	5.1%	4.6%	4.8%
CHLAMYDIA OTHER	# of tests	-	-	-	-	-	-	1,132	3,574	4,706	957	6,936	7,893	-	14,192	14,192
	# positive tests	-	-	-	-	-	-	59	260	319	47	262	309	-	372	372
	% positive*	-	-	-	-	-	-	5.2%	7.3%	6.8%	4.9%	3.8%	3.9%	0.0%	2.6%	2.6%
CHLAMYDIA TOTAL	# of tests	295,148	1,905,793	2,200,941	342,194	2,435,016	2,777,210	391,940	2,136,108	2,528,048	409,642	2,483,474	2,893,116	433,582	2,643,070	3,076,652
	# positive tests	15,718	58,753	74,471	18,786	58,677	77,463	22,652	74,873	93,692	21,278	82,693	103,971	24,690	93,418	118,098
	% positive*	5.3%	3.1%	3.4%	5.5%	2.4%	2.8%	5.8%	3.5%	3.7%	5.2%	3.3%	3.6%	5.7%	3.5%	3.8%

*Percent positive was calculated using only those surveys that provided both the number processed and the number positive.

Appendix 2: GONORRHEA TESTING IN CALIFORNIA, 1996-2001

STD & Type of Test	Test Characteristics	Testing Year (# of responding laboratories that conducted Gonorrhea testing)														
		1996			1997			1999			2000			2001		
		PUBLIC (46)	PRIVATE (705)	TOTAL (751)	PUBLIC (44)	PRIVATE (637)	TOTAL (681)	PUBLIC (41)	PRIVATE (530)	TOTAL (571)	PUBLIC (40)	PRIVATE (375)	TOTAL (415)	PUBLIC (37)	PRIVATE (335)	TOTAL (372)
GONORRHEA Gram Stains	# of tests	9,817	34,040	43,857	7,656	23,461	31,117	3,380	26,828	30,208	5,397	16,189	21,586	5,043	21,695	26,738
	# positive tests	1,372	1,528	2,900	1,238	586	1,824	692	464	1,156	1,384	309	1,693	1,385	211	1,596
	% positive*	14.0%	4.5%	6.6%	16.2%	2.5%	5.9%	20.5%	1.7%	3.8%	25.6%	1.9%	7.8%	27.5%	1.0%	6.0%
GONORRHEA Culture	# of tests	185,507	720,840	906,347	158,354	645,056	803,410	52,485	554,260	606,745	19,864	520,744	540,608	39,956	473,149	513,105
	# positive tests	5,993	6,104	12,097	4,603	5,721	10,324	1,674	3,874	5,548	1,027	3,971	4,998	1,895	3,199	5,094
	% positive*	3.2%	0.8%	1.3%	2.9%	0.9%	1.3%	3.2%	0.7%	0.9%	5.2%	0.8%	0.9%	4.7%	0.7%	1.0%
GONORRHEA DNA Probe	# of tests	73,626	1,104,238	1,177,864	75,523	1,334,210	1,409,733	60,183	1,402,405	1,462,588	37,092	1,385,242	1,422,334	29,569	1,311,812	1,341,381
	# positive tests	540	9,115	9,655	812	7,103	7,915	710	11,702	12,412	635	12,704	13,339	673	13,747	14,420
	% positive*	0.7%	0.8%	0.8%	1.1%	0.5%	0.6%	1.2%	0.8%	0.8%	1.7%	0.9%	0.9%	2.3%	1.0%	1.1%
GONORRHEA PCR	# of tests	-	-	-	-	-	-	-	-	-	8,100	16,704	24,804	18,176	42,010	60,186
	# positive tests	-	-	-	-	-	-	-	-	-	152	232	384	353	393	746
	% positive*	-	-	-	-	-	-	-	-	-	1.9%	1.4%	1.5%	1.9%	0.9%	1.2%
GONORRHEA LCR	# of tests	4,735	7,959	12,694	52,685	33,966	86,651	196,665	175,050	371,715	289,076	195,992	485,068	126,260	459,845	586,105
	# positive tests	80	304	384	870	228	1,098	4,023	1,480	5,503	3,176	2,796	5,972	3,904	7,289	11,193
	% positive*	1.7%	3.8%	3.0%	1.7%	0.7%	1.3%	2.0%	0.8%	1.5%	1.1%	1.4%	1.2%	3.1%	1.6%	1.9%
GONORRHEA TMA	# of tests	-	-	-	-	-	-	-	-	-	3,070	-	3,070	4,208	757	4,965
	# positive tests	-	-	-	-	-	-	-	-	-	-	-	-	3	33	36
	% positive*	-	-	-	-	-	-	-	-	-	0.0%	0.00%	0.0%	0.1%	4.4%	0.7%
GONORRHEA SDA	# of tests	-	-	-	-	-	-	-	-	-	76,458	231,348	307,806	145,607	285,609	431,216
	# positive tests	-	-	-	-	-	-	-	-	-	863	1,260	2,123	2,185	11,332	13,517
	% positive*	-	-	-	-	-	-	-	-	-	1.1%	0.5%	0.7%	1.5%	4.0%	3.1%
GONORRHEA OTHER	# of tests	-	-	-	-	-	-	1,732	8,192	9,924	948	10,692	11,640	-	13,909	13,909
	# positive tests	-	-	-	-	-	-	12	85	97	8	122	130	-	83	83
	% positive*	-	-	-	-	-	-	0.7%	1.0%	1.0%	0.8%	1.1%	1.1%	-	0.6%	0.6%
GONORRHEA TOTAL	# of tests	273,699	1,870,545	2,144,244	294,411	2,037,932	2,332,343	314,445	2,166,735	2,481,180	440,005	2,376,911	2,816,916	368,819	2,608,786	2,977,605
	# positive tests	7,998	17,075	25,073	7,667	13,640	21,307	7,111	17,605	24,716	7,093	21,162	28,255	10,398	36,287	46,685
	% positive*	2.9%	0.9%	1.2%	2.6%	0.7%	0.9%	2.3%	0.8%	1.0%	1.6%	0.9%	1.0%	2.8%	1.4%	1.6%

*Percent positive was calculated using only those surveys that provided both the number processed and the number positive.

Appendix 3: SYPHILIS TESTING IN CALIFORNIA, 1999-2001

STD & Type of Test	Test Characteristics	Testing Year (# of responding laboratories that conducted syphilis testing)								
		1999			2000			2001		
		PUBLIC ()	PRIVATE ()	TOTAL ()	PUBLIC (39)	PRIVATE (401)	TOTAL (440)	PUBLIC (36)	PRIVATE (351)	TOTAL (387)
Non-treponemal Serology										
SYPHILIS RPR & VDRL (& other NT in 2002)	# of tests	198,546	2,700,498	2,899,044	212,041	2,725,268	2,937,309	197,200	2,740,992	2,938,192
	# positive tests	9,225	45,992	55,217	12,506	43,429	55,935	8,213	38,037	46,250
	% positive*	4.6%	1.7%	1.9%	5.9%	1.6%	1.9%	4.2%	1.4%	1.6%
Treponemal Serology										
SYPHILIS FTA-ABS	# of tests	3,051	42,667	45,718	1,950	39,494	41,444	1,371	55,116	56,487
	# positive tests	1,022	11,542	12,564	735	9,848	10,583	489	20,651	21,140
	% positive*	33.5%	27.1%	27.5%	37.7%	24.9%	25.5%	35.7%	37.5%	37.4%
SYPHILIS TP-PA	# of tests	11,240	188,215	199,455	11,560	174,965	186,525	11,040	28,163	39,203
	# positive tests	5,061	13,405	18,466	5,456	13,052	18,508	5,520	11,334	16,854
	% positive*	45.0%	7.1%	9.3%	47.2%	7.5%	9.9%	50.0%	40.2% †	43.0%
SYPHILIS EIA/IgG	# of tests	-	461	461	-	436	436	-	21,681	21,681
	# positive tests	-	66	66	-	69	69	-	1,156	1,156
	% positive*	0.0%	14.3%	14.3%	-	15.8%	15.8%	0.0%	5.3%	5.3%
SYPHILIS Total Treponemal	# of tests	14,291	231,343	245,634	13,510	307,423	320,933	12,411	104,960	117,371
	# positive tests	6,083	26,397	32,480	6,203	23,758	29,961	6,009	33,821	39,830
	% positive*	42.6%	11.4%	13.2%	45.9%	7.7%	9.3%	48.4%	32.2%	33.9%
SYPHILIS Other	# of tests	-	200,877	200,877	-	92,528	92,528	-	139,202	139,202
	# positive tests	-	1,384	1,384	-	789	789	-	680	680
	% positive*	0.0%	0.0%	0.7%	0.0%	0.9%	0.9%	0.0%	0.5%	0.5%
SYPHILIS Darkfield/DFA-TP	# of tests	545	58	603	391	33	424	543	30	573
	# positive tests	29	2	31	12	-	12	69	8	77
	% positive*	5.3%	3.4%	5.1%	3.1%	0.0%	2.8%	12.7%	26.7%	13.4%
Total Syphilis (excluding titers)	# of tests	213,382	3,132,776	3,346,158	225,942	3,125,252	3,351,194	210,154	2,985,184	3,195,338
	# positive tests	15,337	73,775	89,112	18,721	67,976	86,697	14,291	72,546	86,837
	% positive*	7.2%	2.4%	2.7%	8.3%	2.2%	2.6%	6.8%	2.4%	2.7%

*Percent positive was calculated using only those surveys that provided both the number processed and the number positive.

† Note: TP-PA total tests and percent positive tests are marked different in 2001 due to a high volume TP-PA laboratory not responding in the 2001 survey.